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Low Cost / Low Profile Spring Probe

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INTRODUCTION

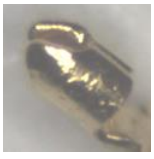
Why One Piece Spring Probes ?

- Most innovative method to make Spring probes by progressive stamping
- Best solution for Mass production/Quality management/Extremely low cost
- Simple metal strip becomes many fully assembled spring probes in a second
- No additional part supply is needed !!!

DESIGN CONSIDERATION

1. Selection of tip shape

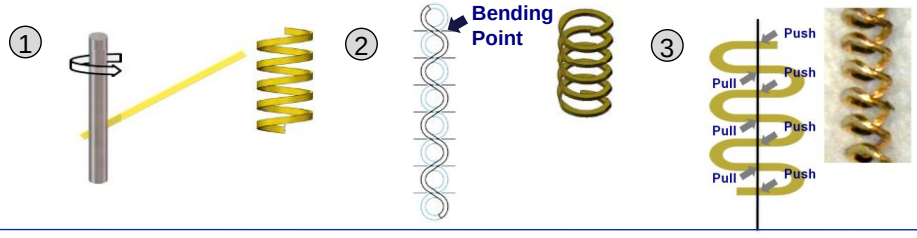

4 sharp tips


2 round tips


cone tip

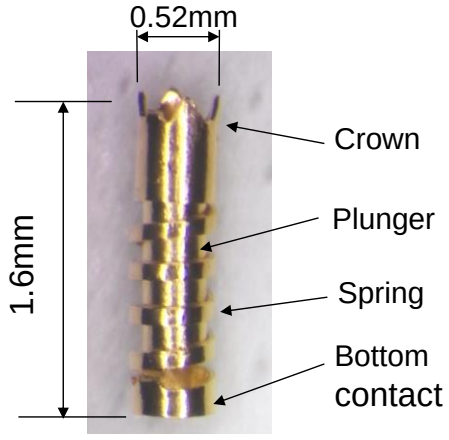

spear head

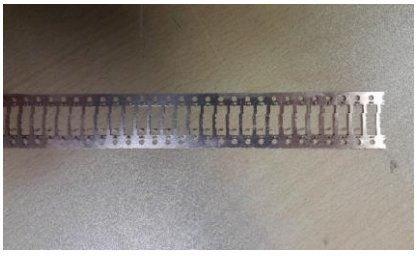
2. Selection of coil spring: A few manufacturing methods by stamping

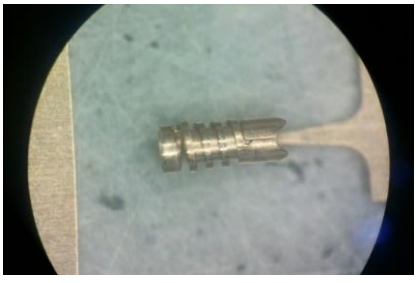


3. Selection of body structure: Various types of intricate body shapes

One piece spring probe
Case study - Low cost version PPSP

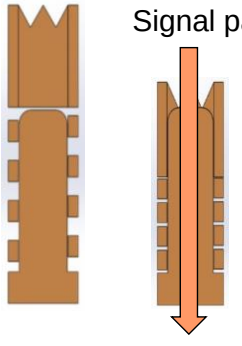






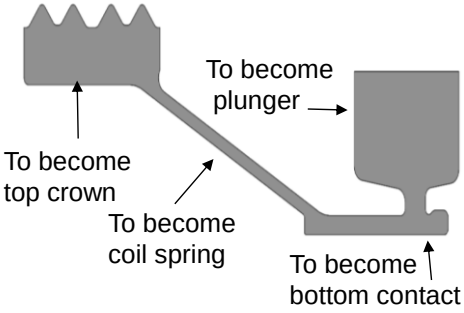
Fully assembled pin attached to the reel

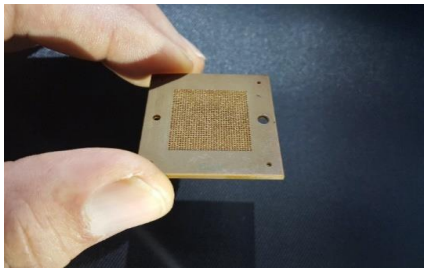
· Material used C1720 BeCu
· Spring force 10 grams
· Stroke 0.38 mm
· Cres 38 milliohm
· Current carrying 3 ampere



- Can control very tight dimensional tolerance
- Crown shape, Spring force and spring diameter can be optional
- Very productive/low cost method to make spring probe for good volume

Planer figure for stamping





One piece spring probes assembled to one piece socket body

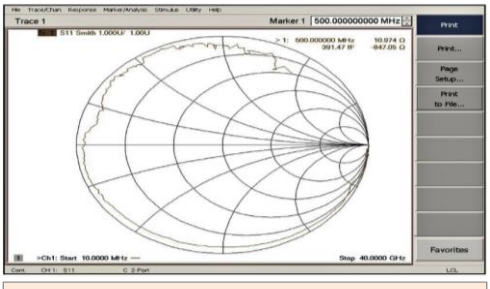
One piece spring probe
Case study Low cost version PPSP

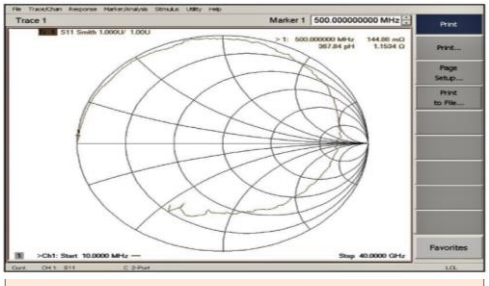
Insertion Loss:
-1dB @ 17 GHz , -3dB @ 39 GHz

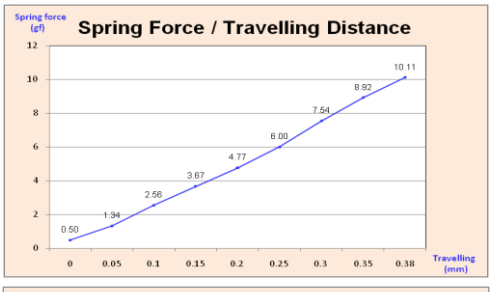
Return Loss:
-20dB @ 5 GHz, -10dB @ 15 GHz

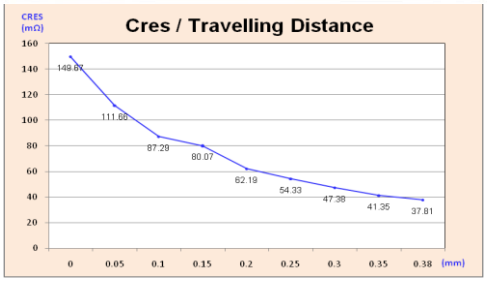
- Capacitance : 0.391pF @ 500 MHz GSG
  open circuit 0.65 mm pitch

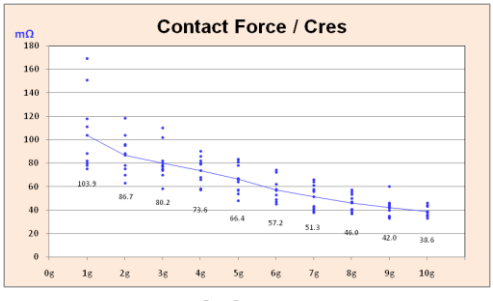
- Inductance : 0.368nH @ 500 MHz GSG
  open circuit, 0.65 mm pitch

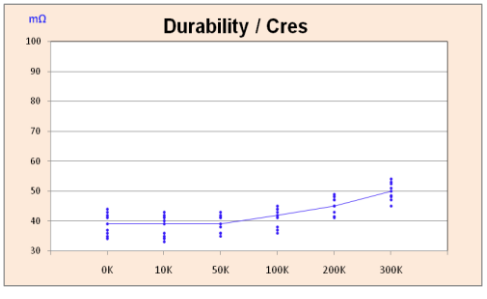












Summary and the next steps

1. Incredibly high speed parts/minute production by stamping
2. Test height can be reduced to 0.8 mm and Cres 20 milliohm – LCC being verified
3. Relatively easier quality management once stamping tool is qualified.
4. Extremely low cost pin for high volume application
5. Reduce lead time for stamping tool for a new pin development